

1044b UIC - EAST POPLAR OIL FIELD  
ENFORCEMENT CASE SDWA 1431  
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Region 8



13655

C. H. MURPHY JR., ET AL

EAST POPLAR UNIT #9  
ROCKY MOUNTAIN DISTRICT

C. H. MURPHY JR., ET AL

EAST POPLAR UNIT #9

C SW SW SEC. 11, TWP. 28N, RGE. 51 E  
ROOSEVELT COUNTY, MONTANA

ELEVATION 2160 K. B.

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HISTORY

ELECTRO LOG DATA

CORE DESCRIPTIONS

CORE ANALYSIS

DRILL STEM TESTS

COMPLETION DATA

PRODUCTION TEST DATA

SAMPLE DESCRIPTION

December, 1976

NASH POPLAR UNIT NO. 9

SUPPLEMENT TO WELL HISTORY

Pressure tubing to 400 PSI. Shut unit down and mixed 1 barrel SP-101 with 100 barrels formation water and pumped down casing. Chased with 50 barrels formation water.

Pressure at start of job. 0 PSI  
Pressure at end of job. 600 PSI

Well left shut in 24 hours.

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EAST POPLAR UNIT NO. 9

SUPPLEMENT TO WELL HISTORY

8-21-77 Pressure well to 380 PSI - shut in. Pumped 2 barrels SP-101 chemical (Fretolite) down well and chased with 400 barrels produced water.

Shut In Countdown.

Maximum PSI 12000

EAST POPLAR UNIT NO. 9

SUPPLEMENT TO WELL HISTORY

- 2-08-92 Rig up pulling unit. Pump stuck. Backed off 90 rods 3/4 pin, release anchor. Tubing stuck. Shut down.
- 2-09-92 Run water down casing 100 to 120 barrels. Stop.
- 2-10-92 Start rig. Rig up power swivel. Turn 10 to 15 minutes and pull tubing. Left 1 and 1/2 joints in hole and 126 - 3/4" rods. Shut down.
- 2-11-92 Start rig run catcher on tubing and test to 6000# psi. Run to 3342'. Pull 117 - 3/4" rods and start running catcher. Run to 1500'. Shut down
- 2-12-92 Start rig. Run tubing and catcher to 4178'. Tight spot in casing, pull out of hole. Run pumping string to 5410'. Start well pumping. Rig down.

EAST POPLAR UNIT NO. 9

SUPPLEMENT TO WELL HISTORY

- 1-11-93 Pump stuck. Move in rig. Rods stuck, backed off rods and pulled 99 rods. Anchor stuck. Work tubing anchor loose. Tubing stuck worked tubing 30'. Stop and ran rods and rigged down.
- 1-21-93 Move in rig up pull rods and rig up power swivel. Start turning tubing 1200 to 1500 lbs. torque. Turn for 45 minutes. Tubing parted. Stop and pulled tubing 150 joints. Top of rods 2475' top of tubing 4594'. 2119' of rods in casing. Shut down.
- 1-22-93 Start rig and pick up tools. Run tools on tubing run to 4132'. Stop and pulled tubing. Pulled 82½ rods. Total rods 181. Run in hole with tools. Tight spot at 4174'. Pulled tubing and tools. Run pumping string. Left 23 joints of 2-7/8" tubing in hole. Left 29½ rods in hole.
- Rod top 4537'. Tubing top 4594'. 2-7/8" collar looking up with about 6" to 1' of tubing looking up.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

East Poplar Unit D Battery and Wells EPU Nos. 6, 9, 11, & 15

The East Poplar Unit D Battery and the wells producing into the battery, EPU 6, 9, 11, & 15, are onshore production facilities located in Roosevelt County, Montana, in the East Poplar Unit Oil Field. The battery consists of a 6' x 27' vertical separator, a circulating pump with appropriate lines, and two 1,000 barrel galvanized bolted tanks. An earthen pit of about 8,000 barrel capacity is located at the tank battery into which the separator or tanks may be emptied if needed for fluid storage.


The field is about 6 miles Northeast of Poplar, Montana, in Townships 28 and 29 North and Ranges 50 and 51 East.

The operator of the East Poplar Unit D Lease is Murphy Oil Corporation located at P.O. Box 547, Poplar, Montana 59255. The corporation headquarters are at 200 Jefferson Avenue, El Dorado, Arkansas 71730.

The foreman, Mr. Gerald Hagadone, is responsible for oil spill prevention at this facility. On each trip to the lease the pumper makes a visual inspection of all facilities and reports any malfunction to the foreman, Mr. Gerald Hagadone, and notes this malfunction on the ten day gauge report. There has been no reportable oil Spill Event during the twelve months prior to January 10, 1974.

The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The field flow lines and well casing of each well are cathodically protected.



Personnel are properly instructed in the operation and maintenance of equipment to prevent oil discharges, and applicable pollution control laws, rules and regulations. Each employee is given these instructions by the field foreman when they are employed. Scheduled prevention briefings for the operating personnel are conducted frequently enough to assure adequate understanding of the SPCC Plan. The procedures are reviewed every six months by the field foreman with each employee. When changes occur in procedures, each employee is informed.

Fluid in the 8,000 barrel storage pit is pumped to the salt water disposal unit if the water is brackish as determined by chloride tests. If only fresh water is contained in the pit it is disposed of by placing on lease roads to control dust and compact the roads. Any oil in the pit is pumped back through the separator with the water being sent to the disposal well. Oil skims are burned by state permits. There are no outlets from the storage pit and all fluids must be pumped out.

The two 1,000 barrel tanks are galvanized and are bolted construction. The tanks are vented to the atmosphere and have unrestricted 4" overflow lines between tanks.

The EPU No. 6 is a flowing well. The EPU Nos. 9, 11, & 15 are pumped with a rod pump. There are 4' x 4' x 2' cellars at each of the pumping wellheads with overflow lines to earthen pits capable of holding a full days production in case of a leak at the well site.

The facilities are about 2.2 miles from the Poplar River. The terrain dips gently West. The soil is sandy and the fields are under cultivation. Because of the

distance to the river, the type of soil, and the terrain the 8,000 barrel pit at the tank battery and the well cellars and overflow pits are sufficient secondary containment for these facilities.

The tanks are observed daily by the pumper. Periodically, the foreman checks the entire tank battery and producing wells closely. If any trouble is suspected, the facility is shut down, the tanks and/or separator are emptied and cleaned. The facility is then thoroughly inspected by service company personnel, repairs are made if needed and the unit is placed back into service.

Produced salt water is pumped to a field gathering system for injection into a salt water disposal well. The above ground facilities are observed daily by the pumper and inspected by the foreman closely on his visits to the lease.

All salt water disposal flowlines are cement asbestos lines. These lines are buried and the surface is observed daily by the pumper.

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Signature \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

10/10/03

CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

\_\_\_\_\_  
Printed Name Of Registered Professional Engineer

(Seal)

\_\_\_\_\_  
Signature Of Registered Professional Engineer

Date \_\_\_\_\_

Registration No. \_\_\_\_\_ State \_\_\_\_\_

11/11/2011

Contingency Plans For An Oil Discharge

East Poplar Unit D Battery and Wells EPU Nos. 6, 9, 11, & 15


The field is visited twice daily by the pumper. Visual inspection is made on each facility on each visit to determine if any malfunction is occurring. The most likely potential oil discharges are checked thoroughly. Periodically, the field foreman, Mr. Gerald Hagadone, will conduct a close check of the entire facility.

The pumpers, Mr. Ferdinand Charette and Mr. Robert Atkinson, have been instructed in the operations and maintenance of equipment to prevent oil and water discharges and informed of the applicable pollution control laws, rules and regulations. If an oil discharge occurs, the pumper will immediately close the proper valves and/or shut down the production facility to stop the discharge. He will then call Mr. Gerald Hagadone who will in turn inform Mr. Bill Brown, District Superintendent. If needed, the proper state and federal agencies will be notified by Mr. Brown. The discharged oil will be reclaimed or disposed of by approved engineering procedures and in accordance to law.

In the event discharged oil collects on standing water such as a stock pond or rain water standing in a low spot, the oil will be pumped into a tank truck. The skim of oil left on the water will be removed by an oil skimmer owned by Murphy Oil Corporation. The skimmer can be towed to the field within an hours time.

If the discharge is in excess of 50 barrels of oil, the Montana Department of Health and Environmental Sciences in Helena will be notified by Mr. Brown.

If a Spill Event occurs as defined by federal law, the Environmental Protection Agency in Denver, Colorado will be notified by Mr. Brown.



Telephone numbers and personnel to be notified in case of an oil discharge are as follows:

Phone Numbers as listed on other copies will be included on final copy.

EPH 7

Indem

10

A.F.E. NO. 53-10

AUTHORITY FOR EXPENDITURE  
MURPHY CORPORATION - EAST IOPLAR UNIT NO. 9  
Center of SW/4 of SE/4 of Section 11-28-51E, Roosevelt County, Montana

WELL DRILLING & CONSTRUCTION EXPENSE:	TO CSG. PT.	COMP. & EQUIP	TOTAL COST
Drilling: Rig up & Rig down	\$ 3,000		\$ 3,000
Day Work - 50 days @ \$850/day (59000)	36,550	5,950	42,500
Loc. survey, permit & prep.	1,000		1,000
Roads, fences, cattleguards, etc.	1,500		1,500
Mud mat. & chem., incl. oil & gas	6,000		6,000
Fuel	6,000		6,000
Water	500		500
Drilling bits, baskets, etc.	3,500	200	3,700
Drill pipe rental	4,000		4,000
Move rig in & out	3,500		3,500
Cementing casing	1,100	800	1,900
Coring materials & services	3,500		3,500
Testing services, incl. swabbing	2,700	350	3,050
Other logs, surveys & analyses	1,100	555	1,655
Perf. & set pkr.		1,500	1,500
Float equip., centralizers, etc.	110	350	460
Tubular inspection, testing, etc.		1,200	1,200
Trucking, welding & other labor	500	800	1,300
Supervision & miscellaneous	2,500	800	3,300
Total estimated well drilling & const. exp.	\$ 77,060	\$ 12,505	\$ 89,565
WELL EQUIPMENT COSTS:			
1000' of 9-5/8" O.D. csg. @ \$3.30/ft.	\$ 3,300		\$ 3,300
6000' of 5-1/2" O.D. csg. @ \$1.75/ft.		10,500	10,500
6000' of 2-3/8" O.D. tag. @ \$.52/ft.		3,120	3,120
Packers, etc.		500	500
Casing head & connections	600	250	850
Xmas tree & connections		1,800	1,800
Total estimated well equip costs	\$ 3,900	\$ 16,170	\$ 20,070
TOTAL ESTIMATED COST OF WELL	\$ 80,960	\$ 28,675	\$ 109,635

This A.F.E. does not include tanks and lease equipment.

APPORTIONMENT OF TOTAL ESTIMATED COSTS

APPROVAL OF EXPENDITURE

Production Department  
Requested by Paul C. M. Donald (AWS)  
Date 7-21-52

Approved

Approved by L. R. D. Easton  
Date 7-21-52 V. P.

By \_\_\_\_\_

Executive Department  
Approved by L. R. D. Easton  
Date 7-21-52 Pres.

AUTHORITY FOR EXPENDITURE  
MURPHY CORPORATION - EAST POPLAR UNIT NO. 9  
C SW SW Section 11, T28N, R51E, Roosevelt County, Montana  
(Installation of Pumping Unit)

Pulling unit - 2 (12 hour) days @ \$300	\$ 600
Pumping unit complete with engine	5,650
Labor & materials setting unit (Contract)	950
Rods, pump, & well head equipment	3,000
Trucking, small fittings, dirt work, and incidentals	1,000
3500' 2 7/8" tubing less 3500' 2 3/8" tubing	770
Otis Wire Line service	300
<b>Total Estimated Cost</b>	<b>\$11,670</b>

Workover Recommendation

Status: Dual-completed. Flowing C Zone through tubing. Average production May, 1957 - 47 BFPD, 8% water (43 BOPD, 4 BWPD) open flow, TFP 20# (flowline pressure). Tested May 9, 1957 - 53 BFPD, 8% water (48 BOPD, 5 BWPD) open flow, TFP 20# (flowline pressure).

B-1 and B-2 Zones co-mingled (dead). Last test April 4, 1957 - flowing through casing, open flow, 47 BFPD, 26% water (35 BOPD, 12 BWPD). B-1 and B-2 Zones died May 7, 1956, all attempts have failed to kick the B Zones off.

Proposed Plan to Increase Production: Set pumping unit, change 3500' of 2 3/8" tubing to 2 1/2", repair Baker Packer seal assembly. Run 2 1/4" seating nipple, Otis separation tool, rods and insert pump. Pump test B-1 and B-2 Zones co-mingled and C Zone individually. Produce B or C Zones selectively or the three zones co-mingled to make the state allowable of 150 BOPD. (Note: to manipulate Otis Choke requires 2" full opening.

Pay cut from production increase of 107 BOPD - 55 days.

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470 %	\$ 3,670
Munoco Company	2.096565 %	245
Placid Oil Company	33.545035 %	3,915
Carter Oil Company	16.335860 %	1,906
Phillips Petroleum Company	16.335860 %	1,906
C. F. Lundgren	.238210 %	28

APPROVAL OF EXPENDITURE

Requested by: MTJ 6-3-57 Date Recommend Approval:

Harold Smith JUN 7 1957 Date Staff Production Man Date

Recommend Approval:

Recommend Approval:

Gordon Kirby JUN 7 1957 Date Budget Supervisor Date

Approved:

Vice President-Operations Date

MTJ:br  
6-3-57

*Tracked to  
Ed. Lundgren  
6/7/57*

File

A.F.E. #9-5021

AUTHORITY FOR EXPENDITURE  
MURPHY CORPORATION - EAST POPLAR UNIT NO. 9  
C SW SW Section 11, T28N, R51E, Roosevelt County, Montana  
(Workover #2)

Pulling Unit 6 (12 hr.) days @ \$300	\$1,800
Cement, deisel oil and service	350
Pump truck and emulsion breaker	500
Retrievable packer and DR latch-on plug (to blank off "C" Zone)	750
Miscellaneous labor and trucking	600
500 Gallons acid job (if needed)	600
<b>Total Estimated Cost</b>	<b>\$4,600</b>

Present Status: "B1 & 2" and "C" Zones Co-Mingled. Latest test October 7, 1958, pumping 519 BFPD, 85% water (441 BWPD, 78 BOPD).

History: Completed September 25, 1952 as dual producer from the "B1 & 2" Zones co-mingled. Initial potential from the "B1 & 2" and "C" Zones was 308 BFPD, 1% water. Accumulated production through August, 1958 is 134,604 BO and 132,248 BW from the "B1 & 2" Zone; and 100,237 BO and 27,386 BW from the "C" Zone; Total Accumulated Production -- 234,841 BO and 159,634 BW.

Justification for Workover: To increase production and lower water cut.

Proposed Workover: Pull rods, circulate with salt water (to hold "C" Zone), pull tubing, run full bore retrievable packer, DR latch-on plug, latch into Model "D" Production Packer at 5805". Pressure test DR plug, packer and spot gel on top of Model "D" packer. Displace water with oil and DOC squeeze "B-1" Zone perforations 5651'-5659" and "B-2" Zone perforations 5668'-5680" with 75 sacks regular cement, reverse out and over-flush to clear perforations and pump test.

Structurally: "B1 & 2" Zone Co-Mingled.

	E.P.U. #9	E.P.U. #7	E.P.U. #5 (DOC squeeze)
"B-1"	-3492	-3508	-3541
"B-2"	-3508	-3527	-3560
Water Cut	85%	62%	22%

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470%	\$1,447
Munoco Company	2.096565%	96
Placid Oil Company	33.545035%	1,543
Carter Oil Company	16.335860%	751
Phillips Petroleum Company	16.335860%	751
C. F. Lundgren	.238210%	12

APPROVAL OF EXPENDITURE

Requested by: MMH 10-14-58 Date Recommend Approval:

Harold Wilson 10-16-58 Date Staff Production Man Date

Division Production Supt.

Recommend Approval:

R. E. ... 10/17/58 Date Budget Supervisor Date

Division Manager

Approved:

Vice President-Operations Date

AUTHORITY FOR EXPENDITURE  
MURPHY CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana

(To Change Out Tbg. and Lower Pump to Bottom)

Pulling Unit (14 hrs. @ \$28.00 per hr.)	\$ 400
1700' - 2 7/8" (Cond. 2) tubing @ \$0.60 per foot	1,025
1200' - 3/4" (Cond. 2) plain rods @ \$0.42 per foot	500
825' - 7/8" (Cond. 2) plain rods @ \$0.53 per foot	450
2 1/2" x 2 1/4" x 8' tubing liner pump	725
Miscellaneous labor, material and trucking	200
Less 1700' - 2 3/8" (Cond. 2) tubing @ \$0.35 per foot	(600)

<u>TOTAL ESTIMATED COST</u>	<u>\$2,700</u>
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Present Status: Pumping from the B1, 2 & C Zones. 251 BFPD, 76% water (50 BOPD 191 BFPD).

Justification: To increase production.

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470%	\$349
Munoco Company	2.096565%	57
Piscid Oil Company	33.545035%	906
Humble Oil & Refining	16.335860%	441
Phillips Petroleum Co.	16.335860%	441
C. F. Lundgren	.238210%	6

APPROVAL OF EXPENDITURE

Requested by: M. J. Daniel 4-21-61  
J. B. Field Production Superintendent Date

RECOMMEND APPROVAL:

RECOMMEND APPROVAL:

Division Production Supt.	Date	Staff Production Man	Date
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RECOMMEND APPROVAL:

RECOMMEND APPROVAL:

Division Manager	Date	Budget Supervisor	Date
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APPROVED:

Vice President - Operations	Date
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MTJ:pm  
4-21-61

File #9  
E.P.U.

A.F.E. NO. 3-1504

AUTHORITY FOR EXPENDITURE  
MURPHY CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana

(Workover No. 3 Repair Casing Leak)

Well Status: - E.P.U. No. 9 pumping from B-1, B-2, and C Zones. 592 BFPD, 99% water ( 6 BOPD 586 BWPD ).

Justification for Expenditure: To check for, locate and repair indicated casing leak.

ESTIMATED COST

Pulling unit 75 hours @ 30 per hour.	\$2,250
Halb. squeeze job and retarder	\$2,000
Baker Tool rental and service	\$1,200
Dia-Log	\$ 400
Misc. labor, material and trucking	\$ 300
TOTAL ESTIMATED COST	\$6,150

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Corporation	31.448470%	\$1,934
Hunoco Company	2.096565%	\$ 128
Placid Oil Company	33.545035%	\$2,062
Humble Oil & Refining Company	16.335860%	\$1,005
Phillips Petroleum Company	16.335860%	\$1,005
C.F. Lundgren	.238210%	\$ 15

APPROVAL OF EXPENDITURE

Requested By: M. J. James 3/5/63  
M. J. James Date

Recommend Approval:

L. L. Duncan 3-8-63  
L. L. Duncan Date

W. J. Thornton 3-11-63  
W. J. Thornton Date

APPROVED:

R. J. Sweeney  
Asst. Manager - P.E. Date

MTJ/sb  
3-6-63

AUTHORITY FOR EXPENDITURE  
MURPHY CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana

(Supplement #1)

JUSTIFICATION

Supplement #1 to AFE No. 3-1504 is to cover the additional cost of locating 5½" casing leaks at 3823' and 3874', swedge out tight place in 5½" casing at 3823', cementing, squeezing, drilling out and changing 1727' of rod cut tubing.

TOTAL ADDITIONAL COST

Pulling unit 19 hours @ 30 per hour	\$ 575
Halb. squeeze job and retarder	\$ 250
Rental tools and service	\$ 950
Dia-Log	<del>\$ (150)</del>
Misc. labor, material and trucking	\$ 600
1727' of 2 7/8" 6.5# EUE Tbg. Class #1 @ \$0.90 per ft.	✓ <u>\$1,550</u>

TOTAL ADDITIONAL COST                      \$3,925

Placid Oil Company	33.5450357	\$1,317
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APPROVED:

151 RQ Swamy  
 \_\_\_\_\_  
 Manager - P. & E.                      Date

AUTHORITY FOR EXPENDITURE  
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana  
(Change Pumping Unit)

**PRESENT STATUS:** Pumping from the B-1, 2 and C Zone commingled. Well Test May 17, 1967 239 BFPD 34 BOPD 205 BWP. Pumping 12-1/2 SPM X 64" X 2" bore pump. Pump spaced at 5712' with 160 peak torque American Pumping Unit. Estimated peak torque head 198,560 Lb. In..

**PROPOSAL:** To reduce the danger of stripping the gear train in the gear box in the 160 Unit. Set Lufkin 228 (in unit stock) and sell the 160 American Unit.

ESTIMATED COST

228 Peak Torque Lufkin Pumping Unit (RM Stock)	\$ 3,000.00
Extend Foundation	\$ 800.00
Exchange Pumping Units	\$ 300.00
Estimated Salvage Value of 160 Pumping Unit	(\$ 1,850.00)
Misc. Labor and Electrical Wiring	\$ 100.00
Total Estimated Cost Net (Including 228 Unit)	\$ 2,350.00

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 739.00
Munoco Company	2.096565%	\$ 49.00
Placid Oil Company	33.545035%	\$ 788.00
Humble Oil and Refining Company	16.335860%	\$ 384.00
Drilling Specialties	16.335860%	\$ 384.00
C. F. Lundgren	.238210%	\$ 6.00

APPROVAL OF EXPENDITURE

Requested by:

APPROVED:

M. T. James  
M. T. James

W. J. Thornton 6-8-67  
Date W. J. Thornton Date

L. L. Duncan 6/7/67  
L. L. Duncan Date

MTJ/sb  
May 24, 1967

Comp. 6-26-67

AUTHORITY FOR EXPENDITURE  
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana

PRESENT STATUS: Pumping from the B-1, 2, and C Zones. February, 1968 Well Test 23 BOPD 207 EHPD.

Tubing Record

Date	Dialog	Hydro-Test	Jts. Added	Feet	Est. Cost
1-5-66	Yes		55	1705'	\$ 2,171.00
5-16-67	No	No	2	62'	\$ 554.00
2-11-67	No	No	1	31'	\$ 675.00
	1	0	58	1798'	\$ 3,400.00

PROPOSAL: Next tubing leak change complete tubing string. (Pay out including lost production 3.1 tubing jobs.)

ESTIMATED COST

Pulling Unit, 20 hrs. at \$34.50	\$ 700.00
5750' of 2-7/8" EUE, J-55, Class No. 2 Tubing at \$0.71 per ft.	\$ 4,075.00
Tuboscope salvaged tubing at \$2.95 per ft.	\$ 550.00
Credit for Estimated 25% Class No. 2 (1438' at \$0.71 per ft.)	(\$ 1,023.00)
Credit for Estimated 25% Class No. 3 (1438' at \$0.98 per ft.)	(\$ 550.00)
Credit for Estimated 50% Class No. 4 (2874' at \$0.20 per ft.)	(\$ 575.00)
Misc. Labor, Trucking and Material	\$ 450.00
Total Estimated Cost	\$ 3,625.00

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 1,140.00
Minoco Company	2.096565%	\$ 76.00
Placid Oil Company	33.545035%	\$ 1,216.00
Humble Oil and Refining Company	16.335860%	\$ 592.00
Drilling Specialties	16.335860%	\$ 592.00
C. F. Lundgren	.238210%	\$ 9.00

APPROVAL OF EXPENDITURE

Requested by:

Approved:

M. J. James  
 M. J. James

2-18-68  
 Date

W. J. Thornton  
 W. J. Thornton

2-18-68  
 Date

MTJ/sb  
 February 12, 1968

*Job Comp - 7-13-68  
 approx cost - \$3,687  
 JH*

AUTHORITY FOR EXPENDITURE  
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana  
(Change Tubing String)

PRESENT STATUS: Pumping from the B-1, 2, and C-3 Zones comingled. Well Test March 7, 1970 38 BOPD 217 BWPD.

Tubing Leak Record

Date	Type Leak	Hydro-Test	Depth	Est. Cost
11-4-69	Collar	Yes	4216'	\$ 1,154
11-11-69	Collar	Yes	4402'	\$ 761
3-3-70	Rod Cut	Yes	2821'	\$ 1,108
				<u>\$ 3,022</u>

PROPOSAL: Next tubing leak change 4050' off bottom of tubing string. Stand top 1500' in derrick and run on top of tubing string. (Pay out including lost production 3.5 tubing jobs.)

ESTIMATED COST

Pulling Unit - 18 Hrs. at \$37.00 per hr.	\$ 675.00
4050' of 2-7/8" Tubing, Class No. 1 at \$1.02 per foot	\$ 4,131.00
Tuboscope salvaged tubing at \$3.10 per joint	\$ 412.30
Credit for estimated 20% Class No. 2 ( 810') at \$0.77 per foot	(\$ 623.70)
Credit for estimated 30% Class No. 3 (1215') at \$0.26½ per foot	(\$ 321.98)
Credit for estimated 50% Class No. 4 (2025') at \$0.20 per foot	(\$ 405.00)
Misc. Labor, Trucking, and Material	\$ 400.00
<b>TOTAL ESTIMATED COST</b>	<b>\$ 4,267.62</b>

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 1,342.09
Munoco Company	2.096565%	\$ 89.47
Placid Oil Company	33.545035%	\$ 1,431.58
Humble Oil and Refining Company	16.335860%	\$ 697.15
Phillips Petroleum Company	16.335860%	\$ 697.15
C. F. Lundgren	.238210%	\$ 10.18

APPROVAL OF EXPENDITURE

Requested by:

Approved:

M. T. James  
M. T. James

3-16-70 W. J. Thornton  
Date W. J. Thornton

3-18-70  
Date

MTJ/sb  
March 16, 1970

\$5603

EPU #9

A.F.E. NO. 5-1500-10

AUTHORITY FOR EXPENDITURE  
MURPHY OIL CORPORATION - EAST POPLAR UNIT NO. 9  
SW SW Section 11, T28N, R51E, Roosevelt County, Montana  
(Change Out Tubing)

PROPOSAL & JUSTIFICATION: It is proposed to change out the bottom 3000' of 2-7/8" tubing.

In the past year this well has had 3 tubing leaks (rod cut) and 2 collar leaks, all below 2500'. As a means of lowering the leak frequency, the bottom 3000' of tubing should be changed. Pay out would be approximately 5 tubing leaks not considering any loss of production. This well is producing at the rate of 107 BFPD 32 BOPD 74 BWPD 61% BS&W.

ESTIMATED COST

Pulling Unit, 15 Hrs.	\$ 1,000
3000' of Cond. 1 2-7/8" tubing at \$2.20/ft.	\$ 6,600
3000' of Cond. 4 2-7/8" tubing	(\$ 1,500)
Pump and Anchor Repair	\$ 1,000
Misc. Labor, Material and Tubing	\$ 250
Total Estimated Cost	\$ 7,350

APPORTIONMENT OF TOTAL ESTIMATED COST

Murphy Oil Corporation	31.448470%	\$ 2,311
Placid Oil Company	33.545035%	\$ 2,466
Exxon Company, U.S.A.	16.335860%	\$ 1,201
Phillips Petroleum Company	16.335860%	\$ 1,201
Munoco Company	2.096565%	\$ 154
C. F. Lundgren	.238210%	\$ 17

APPROVAL OF EXPENDITURE

Requested by:

Approved by:

W. G. Brown  
W. G. Brown

1-15-75  
Date

A. W. Simpson  
A. W. Simpson

1-15-75  
Date

WGB/sb  
January 8, 1975

Job completed without  
any major problems. Cost  
was less than anticipated, due  
to Anchor (top) pump Repair  
and estimated cost of down  
tbg. WGB



HISTORY

COPY RETAINED DISTRICT OFFICE

(SUBMIT IN TRIPLICATE)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEYLand Office Billings  
Lease No. BLM-A-072011  
Unit East Poplar

## SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL	SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY	X
NOTICE OF INTENTION TO ABANDON WELL		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Sept. 19 19 52

Well No. 9 is located 660 ft. from [S] line and 660 ft. from [W] line of sec. 11C SW/4 SW/4 Sec. 11  
(1/4 Sec. and Sec. No.)28N  
(Twp.)51E  
(Range)(Meridian)East Poplar  
(Field)Roosevelt  
(County or Subdivision)Montana  
(State or Territory)The elevation of the ground ~~surface~~ above sea level is 2148 ft.

## DETAILS OF WORK

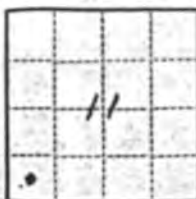
(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Drilled well to 5500'. Cut Core #1, fr. 5497 - 5523'. Rec. 23', dolomite & anhy.  
Cut core #2 fr. 5523 - 57'. Rec. 22', oil show. Cut core #3 fr. 5557 - 72', rec.  
14 1/2' with oil show.

DST #1 5534 - 72' 1/2" bot'm. choke, no water cushion. Tool open at 9:51 AM 9-15  
w/strong blow for 97 min. Closed 10 min. Gas to surf. 84 min., fluid to surf.  
91 min. Flwd. oil, water & gas cut mud.  
Fluid recovered as follows; 546' muddy wtr. lightly cut w/oil & gas,  
2511' wtr. heavily cut (10 to 20%) w/oil & gas., 2477' white clear salt wtr  
cut w/gas chlo. 95,000 PPM. IBHFP - 1000#, FBHFP - 2650#, BHSIP - 2900#  
Hydro - 3175#.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Murphy CorporationAddress P. O. Box 76Poplar, MontanaBy Harold MilamTitle District Production Supt.

Form 9-881a  
(Feb. 1951)

(SUBMIT IN TRIPLICATE)

 UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

 Land Office Billings  
 Lease No. BLM-A-012241  
029305  
 Unit East Poplar Unit

*Penigo*  
**SUNDRY NOTICES AND REPORTS ON WELLS**

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL	SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY	X
NOTICE OF INTENTION TO ABANDON WELL		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

September 22, 1952

Well No. 9 is located 660 ft. from S line and 660 ft. from W line of sec. 11  
C SW/4 SW/4 Sec. 11 28 N 51 E  
 (1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
East Poplar Roosevelt Montana  
 (Field) (County or Subdivision) (State or Territory)

ground  
 The elevation of the ~~surface~~ above sea level is 2118 ft. D.F. 216

## DETAILS OF WORK

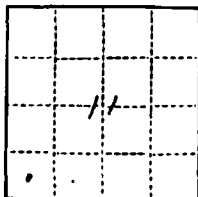
(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Ran Schlumberger & Microlog. Schlumberger T.D. 5837'. Ran 187 joints (5805.34') of 5 1/2" O.D. 15.50 # J-55 German casing, landed 11.40' below R.K.B. Float shoe spaced 20' off bottom @ 5816.74', float collar @ 5785.01'. Centralizers @ 5556, 5630, & 5771. Scratchers from 5530-5545, 5640-5650, 5660-5665, 5680-5695, 5795-5810. Cemented with 250 sax regular cement and gel. (2%). Plug down @ 6:20 PM 9-21-52. Pipe rotated freely thruout cementing operations.

Approved 9-25-52  
*H. Penigo*  
 District Engineer

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Murphy CorporationAddress P.O. BoxPoplar, MontanaBy Harold MilanTitle District Production Supt.



(SUBMIT IN TRIPLICATE)

 UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY

 Land Office Billings  
 Lease No. BLM-A-029305-A  
 Unit East Poplar

 SUNDRY NOTICES AND REPORTS ON WELLS 1 1952

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....	SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL.....	SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR.....	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....	SUBSEQUENT REPORT OF ABANDONMENT.....	
NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....	X
NOTICE OF INTENTION TO ABANDON WELL.....		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Sept. 29, 1952

Well No. 2 is located 660 ft. from S line and 660 ft. from W line of sec. 11  
C SW/4 SW/4 Sec. 11 28N 51E  
 (1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
East Poplar Roosevelt Montana  
 (Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 2161 ft. Gr. 2148

## DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

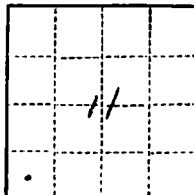
Sept. 23. Picked up 2 3/8" O.D. tubg. w/bit & csg. scraper. Tstd. csg. w/1000# 30 min. Pres. held steady thruout test. Found top of cem. @ 5783', bot'm. of csg. @ 5817', bot'm of hole @ 5837'.

Sept. 24. Perf. B-1 zone fr. 5651-59 w/4 jet shts. per ft. Perf. B-2 zone fr. 5668-80 w/4 jet shts. per ft. Open hole comp. fr. 5817-37 ("C" zone). Ran Baker wire line junk basket to bot'm. & cleaned out. Ran Baker Model D packer and set @ 5805'. Ran 188 jts. (5781.34') 2 3/8" 4.70# J-55 EUE J&L Tubg. w/flush jts. & subs. w/choke (Otis) @ 5803.17'.

Acidized B-1 & B-2 w/1000 gal. Form. broke dwn. w/2000# pres. Injected acid @ rate of 2 1/2 bbls. per min. w/2200# pres. Displaced acid w/24 bbls. wtr. Pres. dropped to 2000# after acid job completed.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Murphy Corporation Approved OCT 1 - 1952  
 Address P. O. Box 76  
Poplar, Montana  
 By Daniel J. McLean  
 Title District Production Supt.



(SUBMIT IN TRIPLICATE)

 UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

 Land Office Billings  
 Lease No. BLM-A-029305  
 Unit East Poplar

## SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....	SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL.....	SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR.....	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....	SUBSEQUENT REPORT OF ABANDONMENT.....	
NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....	<input checked="" type="checkbox"/>
NOTICE OF INTENTION TO ABANDON WELL.....		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

 RECEIVED  
 OCT 1 1952  
 U. S. GEOLOGICAL SURVEY  
 CASPER, WYOMING  
 Sept. 29, 1952

 Well No. 9 is located 660 ft. from S line and 660 ft. from W line of sec. 11
C SW/4 SW/4 Sec. 11 28N 51E  
 (1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)

East Poplar Roosevelt Montana  
 (Field) (County or Subdivision) (State or Territory)

 Approved 17/10/52 OCT 1 - 1952  
 District Engineer

 The elevation of the derrick floor above sea level is 2161 ft. Gr. 2148

## DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Sept. 24 Acidized "C" zone w/1000 gal. Form. broke dwn. w/2000# pres. Injected acid @ rate of 2 1/4 bbls. per min. w/2000# pres. Displaced acid w/23 bbls. wtr. Pres. dropped to 2000# after acid job completed. Now flwg. well to pits.

Sept. 25 Re-Acidized "C" zone w/3000 gal. Broke form. dwn. w/1800# pres. Injected acid (approx. 2500 gal.) at rate of 2 1/4 bbls. per min. w/1800# pres. Injected balance of acid (500 gal.) at rate of 2 bbls. per min. w/1700# pres. Cleaned well to pits. Turned into heater treater @ 6:00 PM 9-25-52. Well produced 308.63 BO in 1 1/4 hrs. thru common flow line 12/64" tubg. ck., 8/64" csg. ck., TFP 50# BS&W 8/10% CFP 425# BS&W 4/10%.

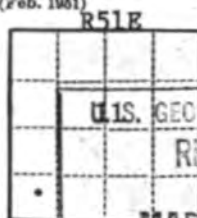
I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

 Company Murphy Corporation

 Address P. O. Box 76
Poplar, Montana

 By Harold Nelson

 Title District Production Supt.



(SUBMIT IN TRIPLICATE)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Land Office Billings, Montana

Lease No. 029305A

Unit East Poplar

*Ref 12*

MAR 11 1963

SUNDRY NOTICES AND REPORTS ON WELLS

BILLINGS, MONTANA

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL	XXX	SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

March 8, 1963

Well No. 9 is located 660 ft. from SW line and 660 ft. from E line of sec. 11

C. of SW SW 11 28N 51E Principal  
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)  
East Poplar Unit Roosevelt Montana  
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 2160 ft.

COPY RETAINED DISTRICT OFFICE

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Will attempt to swedge out collapsed 5 1/2" casing at 3823'  
Then to locate csg. leak and repair.



I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company MURPHY CORPORATION

Address Poplar, Montana

By M. J. James  
Title Field Production Superintendent

## GENERAL RULES

201, 202, 213,  
216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION  
OF THE STATE OF MONTANA  
BILLINGS OR SHELBY

NOTICE!  
THIS FORM BECOMES A  
PERMIT WHEN STAMPED  
APPROVED BY AN AGENT  
OF THE COMMISSION.

## SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	XXX
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

March 25, 1963

Following is a ~~report of work done~~ on land ~~owned~~ leased described as follows:

LEASE A-029305A

MONTANA  
(State)Roosevelt  
(County)East Poplar Unit  
(Field)Well No. 9 11 28N 51E Principal  
(m. sec.) (Township) (Range) (Meridian)

The well is located 660 ft. from { S } line and 660 ft. from { W } line of Sec. 11

(Locate accurately on Plat on back of this form the well location, and show lease boundary.)

The elevation of the derrick floor above the sea level is 2160

READ CAREFULLY

## DETAILS OF PLAN OF WORK

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK  
RESULT

3-7-63 Sdaged out split and collapsed spot in 5 1/2" casing at 3823,  
pressured tested and found another casing leak at 3874.  
Cement squeezed casing leaks at 3823 and 3874.  
Pressure tested squeeze at 1500#. Held ok.

Ran rods, tbg, and pump back in hole and began pumping.

Tested B Zone: 87 BWPD, 76% Water, (65 BWPD, 21 BOPD)

Tested C Zone: 217 BWPD, 90% Water, (196 BWPD, 21 BOPD)

Approved subject to conditions on reverse of form

Date MAR 25 1963

By ORIGINAL SIGNED BY:

R. M. Watkins, Petr. Engr.

Title

District Office Agent

Company Murphy Corporation

By ORIGINAL SIGNED BY M. T. JAMES

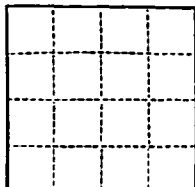
Title Field Production Superintendent

Address Box 547, Poplar, Montana

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

WHEN USED AS PERMIT TO DRILL, THIS EXPIRES 90 DAYS FROM DATE OF APPROVAL

OVER

U. S. GEOLOGICAL SURVEY **SUBMIT IN TRIPLICATE****RECEIVED UNITED STATES****DEPARTMENT OF THE INTERIOR**  
**MAR 26 1963 GEOLOGICAL SURVEY**Lease Agency **Fort Peck**Lease No. **FLM-A 029305A**

BILLINGS, MONTANA

**SUNDRY NOTICES AND REPORTS ON WELLS**

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....	SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL.....	SUBSEQUENT REPORT OF REDRILLING OR REPAIR.....	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....	SUBSEQUENT REPORT OF ABANDONMENT.....	
NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....	<b>XX</b>
NOTICE OF INTENTION TO ABANDON WELL.....		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

**March 25**, 1963Well No. 9 is located 660 ft. from S line and 660 ft. from W line of sec. 11C. of SW SW 11  
(1/4 Sec. and Sec. No.)28N  
(Twp.)51E  
(Range)Principal  
(Meridian)East Poplar Unit  
(Field)Roosevelt  
(County or Subdivision)Montana  
(State or Territory)The elevation of the derrick floor above sea level is 2160 ft.**DETAILS OF WORK**

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

**3-7-63 Swaged out split and collapsed spot in 5 1/2" casing at 3823, pressured tested and found another casing leak at 3874. Cement squeezed casing leaks at 3823 and 3874. Pressure tested squeeze at 1500#. Held ok.**

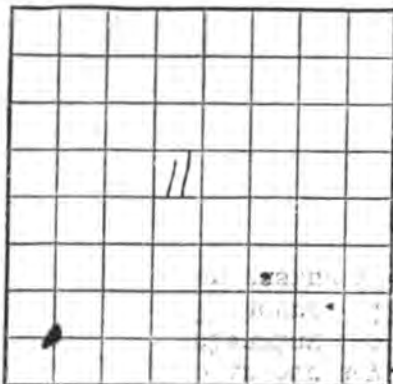
**Ran rods, tbg, and pump back in hole and began pumping.****Tested B Zone: 87 BWPD, 76% Water, ( 65 BWPD, 21 BOPD)****Tested C Zone: 217 BWPD, 90% Water, (196 BWPD, 21 BOPD)**

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Murphy CorporationAddress Box 547Poplar, Montana

**MAR 26 1963**  
Approved  
(ORIG. SCD.) HILLARY A. ODEN  
District Engineer

By ORIGINAL SIGNED BY M. T. JAMESTitle Field Production Superintendent

U. S. LAND OFFICE Billings  
SERIAL NUMBER BLM-A-029305-A  
LEASE OR PERMIT TO PROSPECTUNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

## LOG OF OIL OR GAS WELL

LOCATE WELL CORRECTLY

Company Murphy Corporation Address Poplar, Montana  
 Lessor or Tract U.S.A. Field East Poplar State Montana  
 Well No. 9 Sec. 11 T. 28N R. 51E Meridian Principal County Roosevelt  
 Location 660 ft. [N.] of S. Line and 660 ft. [E.] of W. Line of Sec. 11 Elevation 2148 gr.  
 (Derive four relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed Harold J. Miles  
 Date October 1, 1952 Title District Drilling Supt.

The summary on this page is for the condition of the well at above date.

Commenced drilling 8-28, 1952 Finished drilling 9-20, 1952

## OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 5534 to 5540 No. 4, from 5820 to 5830  
 No. 2, from 5651 to 5659 No. 5, from 5659 to 5668  
 No. 3, from 5668 to 5680 No. 6, from 5680 to 5680

## IMPORTANT WATER SANDS

No. 1, from 5534 to 5540 No. 3, from 5651 to 5659  
 No. 2, from 5651 to 5659 No. 4, from 5659 to 5668

## CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated		Purpose
							From—	To—	
9 5/8	36	8	Nat'l	1011	Baker				Surface
5 1/2	15.50	8	German	5805	Baker		5651	5659	Oil String
							5668	5680	

## MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
9 5/8	1023	400	Pump & Plug		
5 1/2	5817	250	Pump & Plug		

## PLUGS AND ADAPTERS

Heaving plug—Material \_\_\_\_\_ Length \_\_\_\_\_ Depth set \_\_\_\_\_  
 Adapters—Material \_\_\_\_\_ Size \_\_\_\_\_

## SHOOTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
-------------	-----------	------------------------	-------------	-------------	--------------------

## PLUGS AND ADAPTERS

Heaving plug—Material \_\_\_\_\_ Length \_\_\_\_\_ Depth set \_\_\_\_\_  
 Adapters—Material \_\_\_\_\_ Size \_\_\_\_\_

## SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
1 1/2"	Jet		32	8-24-52	5751-59	
1 1/2"	Jet		48	"	5768-80	

## TOOLS USED

It is of the greatest importance to have a complete record of the well. Please state in detail: date, location, whether rotary tools were used from \_\_\_\_\_ feet to \_\_\_\_\_ feet, and from \_\_\_\_\_ feet to \_\_\_\_\_ feet. If the well has been dynamited, give date, size, position, and number of shots. If bridge wires were put in the test for water, state kind of material used, position, and number of shots.

## DATES

U. S. # 2... added 10:00 PM 8-28-52. Put to producing 9-25-52, 19 52

The production for the first 24 hours was 308 barrels of fluid of which 99% was oil; 1% emulsion; \_\_\_\_\_ % water; and \_\_\_\_\_ % sediment. Gravity, °Bé. \_\_\_\_\_

If gas well, cu. ft. per 24 hours \_\_\_\_\_ Gallons gasoline per 1,000 cu. ft. of gas \_\_\_\_\_

Rock pressure, lbs. per sq. in. \_\_\_\_\_

## EMPLOYEES

R. H. Massey \_\_\_\_\_, Driller C. B. Morris \_\_\_\_\_, Driller  
 R. M. Osborn \_\_\_\_\_, Driller \_\_\_\_\_, Driller

## FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
1187	2043	856	Eagle
2043	2202	159	Niobrara
2202	2390	188	Carlisle
2390	2588	198	Greenhorn
2588	2737	149	Graneros
2737	2960	223	Upper Muddy
2960	3003	43	Muddy Sd.
3003	3170	167	Skull Crk.
3170	3952	782	Dakota Silt
3952	4131	179	Ellis-Swift
4131	4308	177	Rierdon
4308	4384	76	Piper Shale
4384	4440	56	Piper Ls.
4440	4636	196	Gypsum Springs
4636	4750	114	Spearfish?
4750	4880	130	Amsden
4880	5042	162	Heath
5042	5167	125	Ottar
5167	5324	157	Kibbey
5324	5417	93	Kibbey Ls.
5417	5534	117	Madison
5534	5651	117	"A"
5651	5668	17	"B-1"
5668	5820	152	"B-2"
5820			"C" porosity

2813	520	5000 & 5100
2813	100	5000 & 5100
2813	100	5000 & 5100

# MIDDING AND CEMENTING RECORD

# HISTORY OF OIL OR GAS WELL

16-43094-1

U. S. GOVERNMENT PRINTING OFFICE

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in, state kind of material used, position, and results of pumping or bailing.

E. P. U. # 9... Spudded 10:00 PM 8-28-52. Drilled to 1029' & set 1011' of 9 5/8" casing @ 1023 and cemented with 400 sax. Plug down @ 12:00 noon 8-30-52. Tested casing with 1000# pressure for 30 minutes. Drilled to 5497'. Cored from 5497' to 5572'.

14' 3" flow to 14' 1" flow Ran DST # 1 5534-72 tool open 91 minutes. Received gas to surface in 84 minutes. Fluid to surface in 91 minutes. Recovered 546' muddy water, 2511' water with oil & gas & 2477' of salt water.

14' 3" flow to 14' 1" flow Ran DST # 2 5534-5512' tool open 1207 minutes. Gas to surface in 137 minutes, fluid to surface in 167 minutes, flowed oil and mud for 40 minutes. Rec. 806' mud cut with oil & gas, 1612' clean oil, 153' mud & 2963' of salt water. Drilled 5572'-5670' & cored 5670'-5694'. Drilled to 5786' and cored to 5843'. Total depth 5843' equal 5839'. Ran Schlumberger ES & Microlog. Schlumberger total depth 5837'.

Date Set 55 0.D. 15.50# J-55 casing to 5817' and cemented with 250 sax regular 2 % gel. Plug down 6:20 PM 9-21-52. Picked up 2" tbg. and tested casing with 1000# pressure for 30 min. Foundation of cement @ 5783'. Drilled to bottom of casing @ 5817' and found bottom of hole at 5837'.

Location 260 ft. of 2" line and 260 ft. of 1" line of 260' ft. Perforated B-1 Zone, 5651-59 with 4 jet shots per foot & B-2 Zone with 4 jet shots per foot. (open hole "C" Zone is 5817'-5837'. Set Baker packer at 5805'. Acidized B-1 & B-2 Zones with 1000 gallons. Maximum pressure 2200#. Acidized "C" zone with 1000 gallons. Maximum pressure 2000#. Flowed both zones to pits. When "C" zone cleaned up it flowed less than 100

bbls per day. Re-acidized "C" zone with 3000 gallons. After cleaning into pits both zones flowed 308 bbls. clean oil in 14 hours. 12/64 choke on tubing ("C" zone) and 8/64 choke on casing (B-1 & B-2 zone)

GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR

UNITED STATES

FILED OF BUREAU OF MINERALS

SERIAL NUMBER 37W-V-038302-V

U. S. FIELD OFFICE BUREAU

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Lease Area: C SW NW Sec 11-T28N-R12E  
 Spacing - 160 acres  
 Elevation: 2140' K.B.  
 Spudded: 8-29-52  
 Completed: 9-25-52  
 T.D.: 5837' Schl.  
 Prod. Zones: B-1 (5651-59) B-2 (5668-80)  
 C Open hole (5817-37')

## Schlumberger Logs

	Depth	Datum	Thickness
Judith River			
Greenhorn	2390	- 230	
Muddy Sd	2960	- 800	
Dakota Silt	3170	-1010	
Pipe Ls	4384	-2224	
Amsden	4750	-2590	
Heath	4880	-2720	
Otter	5042	-2882	
Kibbey Sd	5167	-3007	
Kibbey Ls	5324	-3164	
Madison	*5417	-3257	
A-1	*5518	-3358	2'
A-2	*5524	-3364	4'
A-3	*5534	-3374	8'
A-4	*5542	-3382	24'
B-1	5651	-3491	9'
B-2	*5668	-3508	16'
B-3	*5690	-3530	7'
B-4	*5724	-3564	8'
B-5	5758	-3598	?
C-1	*5800	-3640	?
C-2	*5820	-3660	2'

\*Probable prod. Zones (From DST structural position, etc.)  
 \*Shows

Drill Pipe Corrections (Fads)  
 5405 Driller - 5402 SLN (-3')

## Coring Intervals:

#1 5498-5522 Rec. 23' A-1  
 #2 5522-5556 Rec. 22' A-2, 3 & 4  
 #3 5556-5571 Rec. 14 1/2' Salt Section  
 #4 5670-5694 Rec. 17 1/2' B-1, 2 & 3  
 #5 5780-5817 Rec. 36' C-1  
 #6 5817-5843 Rec. 21' C-2

## Drill Stem Tests:

DST #1 5533-5571, A-3 & 4 Zones. Op 9 1/2 min.  
 SI 10 min. Rec. 546' muddy wtr, lightly cut  
 w/oil & gas, 2512' wtr, hvly cut w/oil & gas,  
 2477' clr s.w. IBHFP 100%, BHSIP 2900#,  
 FBHFP 2650#, Hydro 3175#, Chl, 95,000 ppm.  
 DST #2 5533-5546, A-3 & 4 Zones. Op 3 hrs.,  
 27 min. SI 10 min. Rec 806' mud cut w/oil,  
 & gas, 1612' clr oil, 153' mud cut w/oil &  
 gas, 2963' clr salt wtr w/strks of oil &  
 show of gas. Chl 90,000 ppm. IBHFP 0, FBHFP  
 2425#, BHSIP 2925#, Hydro 3150#.

## History Subsequent to Completion:

None

GEOLOGICAL DATA

C. H. MURPHY JR., ET ALEAST POPLAR UNIT #9

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LOCATION: Center of southwest  $\frac{1}{4}$  of southwest  $\frac{1}{4}$  of Section 11, Township 28 North, Range 51 East, Roosevelt County, Montana.

ELEVATION: 2160 K. B.

SPUDDED: August 29, 1952

COMPLETED: September 25, 1952

TOTAL DEPTH: 5843 Driller; 5839 SLM; 5837 SWSC; 5837 Casing.

HISTORY

August 29-30 Spudded and drilled to 1029' with 12 $\frac{1}{4}$ " jet rock bit.

August 30 Set 1011.45' of 9 5/8" casing at 1023.75' with 400 sacks of cement.

August 31 Waiting on cement.

September 1-12 Drilled from 1029' to 5500' with 8 3/4" bit. 5500 = 5497 SLM.

September 13 Cut and pulled Core #1, 5497-5523.

September 14 Cut and pulled Core #2, 5523-5557. Started cutting Core #3.

September 15 Pulled Core #3, 5557-72. Ran Drill Stem Test #1, 5534-72.

September 16 Ran Drill Stem Test #2, 5534-47. Drilled 5572 to 5603.

September 17 Drilled 5603 to 5668/ 5668=5670 SLM. Cut Core #4, 5670-94.

September 18 Pulled Core #4. Drilled 5694 to 5786.

September 19 Cut and pulled Core #5, 5786-5823.

September 20 Cut and pulled Core #6, 5823-43. Ran Schlumberger ES and Microlog.

September 21-24 Well undergoing completion operations.

E L E C T R O L O G D A T A

Type Log

ES  
Microlog

Interval Logged

1024-5837  
4800-5834

TENTATIVE TOPS

Eagle	1187 (✓ 973)
Niobrara	2043 (✓ 117)
Carlisle	2202 (- 42)
Greenhorn	2390 (- 230)
Graneros	2588 (- 428)
U. Muddy	2737 (- 577)
Muddy Sd.	2960 (- 800)
Skull Crk.	3003 (- 843)
Dakota Silt	3170 (-1010)
Ellis-Swift	3952 (-1792)
Rierdon	4131 (-1971)
Piper Sh.	4308 (-2148)
Piper Ls.	4384 (-2224)
Gypsum Springs	4440 (-2280)
Spearfish (?)	4636 (-2476)
Amsden	4750 (-2590)
Heath	4880 (-2720)
Otter	5042 (-2882)
Kibbey	5167 (-3007)
Kibbey Ls.	5324 (-3164)
Madison	5417 (-3257)
A Zone	5534 (-3374)
B-1	5651 (-3491)
B-2	5668 (-3508)
C Zone Porosity	5820 (-3660)

CORE DESCRIPTIONSCore #1

5497-5523

Rec. 23'

No Analysis

C. T. 20, 20, 19, 18, 15/ 30, 18, 20, 25, 13/ 11, 10, 9, 19, 16/ 15, 19  
18, 24, 19/ 10, 6, 31, 20, 22/ 23

- 3'0" Anhydrite, light gray with 4" dark gray at very top of unit, micro-crystalline, medium hard, bottom 6" has some free oil bleeding from zone with numerous thin dark gray, fine crystalline limestone streaks. Good oil odor and golden-yellow fluorescence in this zone.
- 11'6" Limestone, brownish-gray, micro-fine crystalline, medium hard with numerous thin highly contorted streaks, black calcareous shale and light gray fragmental anhydrite; occasional thin streaks of black shale with angular fragments of medium gray limestone; occasional thin streaks having fair porosity with fair oil odor and yellow fluorescence otherwise No Show.
- 7'6" Limestone, medium brownish-gray, microcrystalline, medium hard, few fairly well developed vertical fractures re-cemented with calcite. Few short, irregular-shaped tight fractures re-cemented with calcite. Occasional spots along fractures showing oil staining and fluorescence, otherwise No Show.
- 1'0" Anhydrite and Shale, light-gray white anhydrite and medium gray shale, entire zone very much ground up, due to plugging of core bit.

Core #2

5523-5557

Rec. 22'

Analysis from 5533 $\frac{1}{2}$ -5555.

(No analysis on bottom 2' due to fracturing and inability to get any suitable sample for analysis.)

- C. T. 18, 17, 14, 10, 13/ 11, 16, 13, 10, 14/ 20, 15, 16, 25, 20/ 25, 22  
20, 21, 24/ 26, 39, 30, 16, 46/ 20, 2, 9, 15, 19/ 16, 21, 25, 39.
- 3'6" Dolomite, light gray, microcrystalline, very hard with numerous thin, black dolomitic shale partings and thin streaks of light gray anhydrite
- 3'6" Anhydrite, light gray, amorphous-microcrystalline, medium hard, numerous streaks of black dolomitic shale, anhydrite becoming fragmental toward base, with dolomitic shale as matrix.
- 1'0" Dolomite, light-medium gray, microcrystalline, very hard with few streaks and numerous inclusions of light gray anhydrite. No Show.
- 4'0" Anhydrite, light-dark gray, amorphous-microcrystalline, medium hard with numerous thin, black shale partings. No Show.
- 10'0" Limestone, medium brownish-gray, fine-very fine crystalline, medium hard,

(Core #2 continued)

5547-57 fair vuggy porosity with numerous small pin-point to  $\frac{1}{4}$ " vugs; numerous well-developed fractures with numerous short, irregular tight fractures in top 8'. Bottom 2' very highly fractured and broken up into small pieces. Good oil stain and odor along fractures and some oil bleeding from vugs, good golden-yellow fluorescence along fracture planes.

Core #3

5557-72

Rec. 14 $\frac{1}{2}$ '

C. T. 9, 10, 19, 22, 30/ 20, 20, 25, 33, 27/ 23, 11, 38, 72, 26/

2'0" Limestone, greenish-gray, earthy, slightly oolitic, medium soft, good porosity and permeability, good oil odor and stain, good bright golden yellow fluorescence, very fossiliferous.

2'0" Limestone, brownish-gray, amorphous-microcrystalline, medium hard, numerous short, fairly tight irregular fractures throughout, good oil odor and stain along fractures, good golden-yellow fluorescence. Few fairly large ( $\frac{1}{4}$ " ) vugs with free oil bleeding from them, most vugs lined with calcite crystals.

6'6" Limestone, greenish-gray, oolitic, medium soft, very good porosity and permeability, very fossiliferous, good oil odor and stain; good, even, golden-yellow fluorescence.

4'0" Anhydrite, light gray, microcrystalline, medium hard, numerous thin black shale partings, No Show.

Analysis run on samples from 5557 to 5567.

Core #4

5670-94

Rec. 17 $\frac{1}{2}$ '

C. T. 5, 5, 14, 13, 9/ 5, 6, 14, 25, 40/ 27, 23, 30, 40, 15/ 10, 13, 24, 18, 17/ 33, 40, 40, 40,

16'0" Limestone, dark brownish-gray, amorphous to microcrystalline with few thin streaks. Medium crystalline fair inter-crystalline porosity in medium crystalline limestone, hard, amorphous limestone very highly fractured and broken up. Fractures are short, irregular and fairly tight with some open vertical fracturing. Good oil odor and taste along fractures and in porous zones, fair spotted yellow fluorescence in same zones, few thin streaks bleeding oil.

1'6" Limestone, dark brownish-gray, amorphous-microcrystalline, very hard, dense, No Show.

Core #5

5786-5823

Rec. 36'

No Analysis; Core very hard and dense.

- 12' Limestone, dark brownish-gray, microcrystalline with few thin streaks medium crystalline; few thin streaks and inclusions light gray to white anhydrite; occasional very tight incipient vertical fractures, otherwise, entire unit is hard and dense.
- 0'6" Dolomite, brownish-gray, amorphous to microcrystalline, very hard and dense, has wet appearance. No Show.
- 4'6"  
C-1 Limestone, dark brownish-gray, amorphous to microcrystalline, very hard, numerous thin black shale partings; few thin, tight, hairline vertical fractures, otherwise very hard and dense. No Show.
- 1'0" Anhydrite, dark gray, amorphous to microcrystalline, medium hard, few very thin black shale partings. No Show.
- 4'0" Dolomite, dark gray to black, amorphous, very hard, dense, except for single 3" streak of limestone with fairly large inclusion of white anhydrite at 5806. No Show.
- 10'0"  
C-12 Limestone, dark brownish-gray, fine crystalline, very hard with few very thin, tight, cemented vertical fractures. No Show, except for 3" streak dark brownish-gray, medium crystalline limestone with faint oil odor and very dull yellow fluorescence at 5813.
- 4'0" Limestone, dark brownish-gray, very fine to fine crystalline, very slightly porous, very hard, very faint sulphurous oil odor on fresh break, no stain, fluorescence, or taste.

Core #6

5823-43

Rec. 21'

- 0'6" Limestone, light brownish-gray, very fine to fine crystalline, medium hard, few scattered brown calcite crystals, very slight sulphur odor. No Show.
- 11'0"  
C-3 Limestone, brownish-gray, medium hard, fine crystalline, fair inter-crystalline porosity, good oil saturation, good oil odor and even stain, fair, even, golden-yellow fluorescence; fairly well-developed, vertical fractures; (from 5829-33½); few scattered short tight poorly developed fractures above 5829.
- 9'6" Limestone, medium gray, medium hard, very fine crystalline, with few scattered small brown calcite crystals, very fossiliferous, some pyrite replacements; few fairly well-developed stylolitic partings, few tight, fairly well-developed vertical fractures in upper 3' with fracture planes heavily covered with calcite crystals. No Show.

Company MURPHY CORPORATION Date Report September 15, 1952 Page 1 of 1  
 Well East Poplar Unit No. 9 Cores Diamond File   
 Field East Poplar Formation Charles Analysts RWH, WBM  
 County Roosevelt State Montana Elevation  Coregraph Yes  
 Location Sec. 11-28N-51E Remarks Service No. 9

## CORE ANALYSIS RESULTS

Sample Number	Depth Feet	Permeability Millidarcys  Kmax K90	Porosity Per Cent	Residual Saturation	
				Oil % Volume	Total Water % Pore
1	5533.5-34.4	*	0.5	0.0	60.0
2	36.0	*	2.6	11.5	46.2
3	37.3	*	1.7	17.7	70.7
4	38.7	*	1.3	15.4	69.3
5	40.3	*	2.4	8.3	70.8
6	42.2	*	2.3	13.1	65.4

\* Unfit for analysis - broken and fractured.

Company MURPHY CORPORATION Date Report September 26, 1952 Page 1 of 1  
 Well East Poplar Unit No. 9 Cores Diamond File   
 Field East Poplar Formation Madison Analysts RWH, WBI  
 County Roosevelt State Montana Elevation 2160' KB  Coregraph Yes  
 Location Sec. 11-28N-51E Remarks  Service No. 9

### CORE ANALYSIS RESULTS

Sample Number	Depth Feet	Permeability Millidarcys		Porosity Per Cent	Residual Saturation		
		Kmax	K90		Oil %Volume	Total Water %Pore	% Pore
7	5557.0-58.6	5.3	3.2	7.4	10.8		31.1
8	60.2	1.3	0.3	4.0	15.0		37.5
9	62.0	0.4	<0.1	6.9	10.1		43.5
10	63.9	22	20	13.9	11.5		26.6
11	65.7	150	140	12.3	14.6		31.7
12	67.2	*	*	9.6	12.5		31.2
13	68.0	<0.1	<0.1	0.8	0.0		50.0
14	5670.0-71.6	*	*	11.9	23.6		37.8
15	73.0	*	*	14.5	15.8		52.3
16	74.3	*	*	10.1	21.8		24.7
17	76.0	*	*	12.6	14.3		47.6
18	77.4	*	*	5.7	8.8		54.4
19	79.0	*	*	9.9	10.1		52.5
20	80.5	*	*	11.2	9.9m		53.5
21	82.0	*	*	8.8	12.5		50.0
22	83.8	*	*	11.2	15.2		41.1
23	85.0	*	*	9.2	18.5		43.5
24	86.0	*	*	3.4	17.6		41.8
25	87.0	*	*	1.0	0.0		90.0
26	5823.0-24.3	0.9	0.2	6.6	37.9		30.5
27	25.5	1.5	0.6	13.2	34.8		23.5
28	26.4	3.2	2.0	15.4	31.8		37.0
29	27.5	4.3	3.2	14.8	31.1		35.8
30	29.0	3.9	2.7	14.6	34.9		32.9
31	30.4	*	*	14.4	28.4		26.4
32	31.6	*	*	12.9	20.9		23.2
33	32.8	*	*	11.9	28.6		23.5
34	34.0	2.9	1.4	11.6	28.4		29.3
35	35.0	<0.1	<0.1	3.0	26.6		36.6

(\*) Unsuitable for analysis - broken and fractured.

# D R I L L S T E M T E S T S

DST No. 1, 5534-72,  $\frac{1}{2}$ " bottom choke, no water cushion, Tool open 9:51 A. M. with strong blow (97 minutes), closed 10 minutes, gas to surface in 84 minutes; fluid to surface in 91 minutes; flowed mud, cut with oil, gas and salt water.

## Fluid recovery in order:

546' muddy water, lightly cut with oil and gas.  
2511' water, heavily cut (10-20%) with oil and gas.  
2477' clear salt water (cl. 95,000) cut with gas.

IBHFP: 1000# BHSIP: 2900# FBHFP: 2650# Hydro: 3175#

DST No. 2, 5534-47, Johnston Tool straddle packers,  $\frac{1}{2}$ " bottom choke, no water cushion, Tool open with strong blow, weakened to good steady blow for remainder of test. Tool open 3 hours 27 minutes. Closed 10 minutes. Gas to surface 137 minutes. Fluid to surface 167 minutes. Flowed oil cut with mud for 40 minutes. TFP on  $\frac{1}{4}$ " choke-44#. Top closed-in pressure-550#.

## Recovered:

806' mud cut with oil and gas.  
1612' clean oil.  
153' mud cut with oil and gas.  
2963' clear salt water with few streaks oil  
and show of gas, (cl. 90,000 ppm)

IBHFP: 0 FBHFP: 2425# FBHFP:  $\frac{1}{4}$ " choke: 2500#  
BHSIP: 2925# Hydro: 3150#

S A M P L E   D E S C R I P T I O N

- 1500-1620    No Samples.
- 1620-1780    Shale; light gray, very sandy, medium soft with a trace of bentonite.
- 1780-1940    No Samples.
- 1940-2060    Shale; light to medium gray, medium soft; slightly sandy; trace of bentonite, trace of pyrite.
- 2060        Sample Top Niobrara.
- 2060-2100    Shale, medium gray, very calcareous; numerous small tan to light brown specks.
- 2100-2250    Shale; medium gray, slightly sandy, medium firm, slightly calcareous.
- 2250-2280    Shale; same as above, but with a trace of bentonite.
- 2280-2320    No Samples.
- 2320-2400    Shale; medium to dark gray; very slightly sandy; medium firm; trace of bentonite.
- 2400        Sample Top Greenhorn.
- 2400-2470    Shale; medium to dark gray; very calcareous; numerous small tan calcareous specks; trace of bentonite.
- 2470-2510    Shale; medium to dark gray; slightly calcareous; medium firm; trace of pyrite.
- 2510-2560    Shale; brownish-gray, firm, slightly micaceous; trace of light gray, fine grained porous sandstone; trace of pyrite.
- 2560-2620    Shale; dark gray, firm, micaceous; trace of bentonite; trace of pyrite.
- 2620-2640    No Sample.
- 2640-2705    Shale; light to medium gray, firm, micaceous; trace of bentonite.
- 2705        Sample Top Upper Muddy.
- 2705-2975    Shale; medium gray, firm, micaceous with some light gray, very calcareous siltstone.
- 2975        Sample Top Muddy.
- 2975-3040    Sandstone; light gray, fine grained, numerous small black specks giving a salt and pepper appearance, very slightly glauconitic.

- 3040-3125 Shale; light gray and dark gray, firm, sandy, with some fine grained porous salt and pepper sandstone.
- 3125-3180 Sandstone; light gray, fine grained, porous; sand grains well-rounded; some dark gray, sandy shale.
- 3180-3260 Shale; light gray, firm, sandy shale and dark gray, firm micaceous Shale; some light gray, fine grained porous sandstone.
- 3260-3280 Sandstone; medium gray, fine to medium grained, porous; sand grains well rounded; some dark gray shale.
- 3280-3395 Shale; light gray, fairly soft, slightly sandy; some light gray, porous sandstone.
- 3395-3420 Sandstone; light gray, fine grained, poorly cemented; sand grains well rounded; some dark gray slightly micaceous shale.
- 3420-3430 Shale; light gray, soft, slightly sandy; some light gray, friable, fine grained sandstone.
- 3430-3450 Sandstone; light gray, very fine grained, unconsolidated to very poorly consolidated; some dark gray, firm shale.
- 3450-3610 Shale; dark gray, firm, slightly carbonaceous, splintery; some light gray silt.
- 3610 Sample Top Morrison.
- 3610-3650 Sandstone; light gray, medium grained, very porous, very glauconitic; sand grains well rounded; some dark gray to black shale.
- 3650-3710 Shale; medium to dark gray, firm, medium hard; some light gray silt.
- 3710-3800 Silt; light gray, soft; some firm, dark gray shale.
- 3800-3945 Shale; medium to dark gray, firm, micaceous; trace of pyrite; trace of light gray silt.
- 3945 Sample Top Ellis.
- 3945-4000 Sandstone; fine grained, light gray, very calcareous, very tight; some light gray shale.
- 4000-4050 Shale; light greenish-gray, very calcareous, firm, splintery; trace of pyrite.
- 4050-4120 Shale; light greenish gray, slightly calcareous, firm, splintery; some brown, chunky shale.
- 4120-4180 Shale; light gray, calcareous, splintery; some dark brown shale.
- 4180-4210 Shale; as above with trace of dense, brown Limestone.

- 4210-4250 Shale; dark brownish-gray to light gray, fissile, calcareous; trace of light gray silt.
- 4250-4280 Shale; as above with some dark brown, dense limestone.
- 4280-4305 Shale; dark brownish-gray, firm, medium hard; trace of dense, brown limestone.
- 4305 Sample Top Piper Shale.
- 4305-4380 Shale; light gray, firm, slightly fissile; with some dark red, soft, slightly anhydritic shale.
- 4380 Sample Top Piper Limestone.
- 4380-4430 Limestone; light to dark brown, dense, microcrystalline, fossiliferous; some red and gray shale.
- 4430-4460 Limestone; light gray, very sandy, medium soft; some light gray shale.
- 4460-4530 Shale; greenish-gray, fissile, splintery; some red shale; some dense brown limestone.
- 4530-4550 Limestone; light gray, dense, medium hard, amorphous; some red and gray shale.
- 4550-4610 Shale; light greenish-gray; medium hard, fissile; some soft red shale.
- 4610-4640 Shale; dark red, medium soft, very anhydritic; some dense, gray limestone.
- 4640-4670 Sandstone; red, fine grained, calcareous, very hard and tight; some red and gray shale.
- 4670-4690 Shale; light greenish-gray, fissile, medium hard; trace of red shale; trace of white anhydrite.
- 4690-4720 No Sample.
- 4720-4730 Sandstone; red, very fine grained, calcareous; some red and green shale.
- 4730 Sample Top Amsden.
- 4730-4760 Limestone; pink, dolomitic, amorphous, medium hard; some red calcareous sandstone; some red shale; trace of white anhydrite.
- 4760-4790 Limestone; medium gray, dense amorphous; some red, green, gray shale; trace of white anhydrite.
- 4790-4820 Limestone; light pink and gray, microcrystalline, medium soft; some red, green, gray shale.
- 4820-4900 Shale; red, green, gray, purple, medium hard, firm; some light gray limestone; trace of ankerite.

- 4900 Sample Top Heath.
- 4900-5000 Sandstone; red and gray, fine to medium grained; sand grains very angular; some varicolored shales.
- 5000-5040 Shale; light and dark gray, micaceous; medium firm; some varicolored shales.
- 5040-5060 Limestone; light gray, microcrystalline, medium soft; some red and green variegated shale; trace of anhydrite.
- 5060-5070 Shale; red and gray, variegated, firm; trace of light gray limestone.
- 5070-5100 Limestone; light gray, microcrystalline; some variegated red and gray shale.
- 5100-5170 Shale; red and gray variegated, firm; some light gray microcrystalline limestone; some white anhydrite.
- 5170 Sample Top Kibbey Sandstone.
- 5170-5220 Sandstone; red and gray, fine to medium grained, porous, gypsiferous; some red shale; trace of anhydrite.
- 5220-5240 Shale; dark red, silty, firm; some fine grained red sandstone; trace of white anhydrite.
- 5240-5320 Sandstone; dark red, fine to medium grained, fairly porous, gypsiferous; some red and gray firm shale.
- 5320 Sample Top Kibbey Limestone.
- 5320-5350 Limestone; very light gray, sandy, medium hard; some red and gray sandstone; trace of firm, red shale.
- 5350-5420 Shale; red, and gray, firm, medium hard, splintery; some red, fine grained sandstone; trace of anhydrite.
- 5420 Sample Top Charles.
- 5420-5440 Anhydrite; light gray to white, soft; some red and gray shale.
- 5440-5500 Limestone; gray, dense, microcrystalline, medium hard; some soft white anhydrite; trace of red and gray shale.
- 5500 = 5497 SLM
- 5497-5523 Core No. 1
- 5523-5557 Core No. 2
- 5557-5572 Core No. 3
- 5572-5610 Limestone; brownish-gray, medium hard, microcrystalline; some gray, dense, dolomite; trace of white anhydrite.

- 5610-5620 Anhydrite; light gray to white, medium soft; some red shale and dense, brownish-gray limestone.
- 5620-5650 Limestone; dark brownish-gray, microcrystalline, medium hard; some light gray to white anhydrite and gray dolomite.
- 5650-5662 Limestone; dark brownish-gray, amorphous; very hard, very highly fractured; some gray shale and light gray dolomite. *B-1*
- 5662-5668 Anhydrite; light gray to white, medium soft; some brown limestone and gray dolomite.
- 5668 = 5670 SLM
- 5670-5694 Core No. 4
- 5694-5700 Limestone; light gray, very fine crystalline, medium hard; some gray shale; trace of light gray anhydrite and trace of gray dolomite.
- 5700-5720 Anhydrite; white, amorphous, medium soft; some dense, gray limestone.
- 5720-5730 Limestone; brownish-gray, dense, amorphous; some gray dolomite; trace of light gray to white anhydrite.
- 5730-5745 Anhydrite; light gray to white, amorphous, medium soft; some dense, brownish-gray limestone.
- 5745-5760 Limestone; brownish-gray, microcrystalline, medium hard; some light gray, dense dolomite; some white anhydrite.
- 5760-5770 Anhydrite; light gray to white, amorphous; medium soft; some dense, brownish-gray limestone; trace of light gray dolomite.
- 5770-5786 Limestone; dark brownish-gray, amorphous to microcrystalline, very hard; some light gray, hard dolomite.
- 5786-5823 Core No. 5
- 5823-5843 Core No. 6

Total Depth: 5843 Driller = 5839 SLM  
 Total Depth: Schlumberger = 5837

C O M P L E T I O N   D A T A

TYPE COMPLETION: Dual; B-Zone through annulus; C Zone through tubing.

PERFORATIONS: 5651-5659 (B-1); 5668-5680 (B-2); Open Hole 5817-5837 (C); (All Schlumberger measurements).

CASING: 5805.34' of 5½" set at 5816.74 with 250 sacks of regular cement.

PACKERS: Baker Model "D" Production Packer set at 5805.

ACID: 1000 gallons in B-1 and B-2.  
1000 gallons in C Zone.  
3000 gallons in C Zone.

TUBING: 2 3/8" EUE set on packer at 5805 with tail pipe to 5824.

RECEIVED 12-23-68

PRODUCTION TEST DATA

E.P.U. Well No. 9

September, 1952

CASING PRODUCTION - "B-1" and "B-2" Zone

<u>Date</u>	<u>Choke</u>	<u>BS&amp;W</u>	<u>Fluid</u>	<u>Water</u>	<u>Oil</u>	<u>Casing Pressure</u>
25	1/4	4.	67.71	2.71	65.00	450#
26	12/64	3.	210.96	6.33	204.63	425#
27	12/64	1.	63.64	.64	63.00	425#
			<u>342.31</u>	<u>9.68</u>	<u>332.63</u>	
Average:	13/64	2.67	114.10	3.23	110.87	433.33#

TUBING PRODUCTION - "C" Zone

<u>Date</u>	<u>Choke</u>	<u>BS&amp;W</u>	<u>Fluid</u>	<u>Water</u>	<u>Oil</u>	<u>Tubing Pressure</u>
25	1/4	10.0	60.39	6.04	54.35	75#
26	8/64	8.0	113.04	9.04	104.00	50#
27	open	7.0	200.45	14.08	186.37	25#
28	10/64	.4	184.07	Neg.	184.07	100#
29	8/64	.4	102.85	Neg.	102.85	100#
30	10/64	.4	10.83	Neg.	10.83	100#
			<u>671.63</u>	<u>29.16</u>	<u>642.47</u>	
Average:	20/64	4.37	111.94	4.86	107.08	75#

TOTAL OIL produced East Poplar Unit Well No. 9: 975.10 bbls.  
Average per day: 162.52 bbls.

SERVICE & TESTING



WORKOVER HISTORY NO. 1

Date February 18, 1957

Lease and Well East Poplar Unit No. 9

Field East Poplar County Roosevelt State Montana

Well Location C SW SW Section 11, T28N, R51E

Status Prior to Present Job:

Date Completed September 25, 1952 Date Last Workover None

TD 5837 PBTD None Producing Zone B1, B2, and C zones of Madison Formation

Perforations B-1 zone 5651-59' w/4 j.s.p.f.; B-2 zone 5668-80 w/4 j.s.p.f.;

C zone 5817-37' w/ open hole Cumulative Production B1&2 zone 49,546 bbls oil;  
2,525 bbls water; C zone 3,246 bbls oil, 4,082 bbls water.

Latest Test B-1 & 2 zone 8 BOPD with 76% water

Justification for Workover:

To increase oil production from the B1 & B2 zones.

Summary of Workover:

11-7-53: 5837' TD. Fished out Otis side door choke with wire line. Ran and set Otis separation tool to black off "C" zone and flow "B" zones through tubing. SITP 600#.

11-10-53: 5837' TD. Acidized B zones through perforations - B-1 5651-59' and B-2 5668-80' with 1000 gallons gel-acid, 2000 gallons etching acid. Maximum pressure 2350# while injecting 5 BPM. Pressure bled to 1400# on shut down. Turned to pit at 2:57 P.M., 11-10-53. Spent acid to surface in 10 minutes. New oil to surface in 17 minutes.

Re-cap of Workover:

1. Perforations B-1 5651-59' (unchanged) B-2 5668-80' (unchanged)  
C zone 5817-37' (blanked off)
2. PBTD = TD 5837' (unchanged)
3. Initial Potential after workover - 97 BOPD w/54% water.
4. Name of Producing Zone - B1 & B2 zone of Madison formation.
5. Down Hole Equipment - 1011' of 9 5/8" casing; 5805' of 5 1/2" casing; 5826.71' of 2 3/8" casing. Baker Model D production packer at 5805'; Type "F" otis choke and separation tool at 5803'.

Workover History No. 1 Continued

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Results of Workover:

B-1 and B-2 zone oil production was increased from 8 BOPD with 76% water to 97 BOPD with 54% water. Workover successful.

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WORKOVER HISTORY NO. 2

January 29, 1959

Lease and Well Number: East Poplar Unit Well No. 9  
Field: East Poplar County: Roosevelt State: Montana  
Well Location: C SW SW Section 11, T28N, R51E

Status Prior to Present Job:

Date Completed: September 25, 1952 Date of Last Workover: November 10, 1953  
T.D.: 5837' PBTD: None Producing Zones: "B1, 2 & C" Zones of Madison  
Formation Perforations: "B-1" Zone 5651'-5659'; "B-2" Zone 5668'-5680'  
and "C" Zone 5817'-5837' Cumulative Production: through December, 1959 was  
"B1 & 2" Zones -- 139,356 BO and 155,436 BW; "C" Zone -- 104,660 BO and  
33,061 BW Latest Test: Pumping from "B1 & 2" Zones 205 BWPD, 44 BOPD

Justification for Workover: to increase oil production and lower water cut.

Summary of Workover:

- 1-12-59 TD 5837' - Rigged up pulling unit to DOC squeeze "B-1" Zone (5651-59') and "B-2" Zone (5668-80'). Pulled rods. Made trip with tubing to run Halliburton R.T.T.S. packer and Baker DR plug. Set DR plug in Model "D" production packer to protect "C" Zone perforations while squeezing "B" Zones.
- 1-13-59 TD 5837' - Tested DR plug with 2500#, held. Spot gel plug on top of DR plug. Broke formation with 1100#. DOC squeezed "B-1" Zone (5651-59') and "B-2" Zone (5668-80') with 70 sacks regular cement, squeezed 50 sacks out in formations. Maximum pressure 1200#. Reversed out 20 sacks. Broke formation and over-flushed with 3 barrels oil at 1000#. Pressured up to 200# and let set overnight.
- 1-14-59 TD 5837' - Made trip with tubing to remove Halliburton packer and run seating nipple. Ran rods with 2-1/2" x 2" x 12' Oil Well pump with 3 cup top hold down. Moved off pulling unit. Water cut at 7 A.M., was 68%.
- 1-15-59 TD 5837' - On 3 hour test, pumped at the rate of 216 BFPD, 75% water (54 BOPD, 162 BWPD).
- 1-16-59 TD 5837' - On 3 hour test, pumped at the rate of 216 BFPD, 75% water (54 BOPD, 162 BWPD).

### Summary of Workover continued

- 1-17-59 TD 5837' - On 24 hour test, pumped at the rate of 209 BFPD, 75% water (52 BOPD, 157 BWPD).
- 1-18-59 TD 5837' - On 18 hour test, pumped at the rate of 208 BFPD, 78% water (46 BOPD, 162 BWPD).
- 1-19-59 TD 5837' - On 6 hour test, pumped at the rate of 208 BFPD, 76% water (158 BWPD, 50 BOPD), Chlorides 98,000 PPM.
- 1-20-59 TD 5837' - Down due to power failure. On 24 hour test, pumped at the rate of 203 BFPD, 77% water (47 BOPD, 156 BWPD).
- 1-21-59 TD 5837' - No test, power off.
- 1-22-59 TD 5837' - On 4 hour test, pumped at the rate of 218 BFPD, 78% water (48 BOPD, 170 BWPD).
- 1-23-59 TD 5837' - On 24 hour test, pumped at the rate of 203 BFPD, 78% water (45 BOPD, 158 BWPD). To re-DOC squeeze. To temporarily drop from report.
- 1-28-59 TD 5837' - On 24 hour test, pumped at the rate of 218 BFPD, 79% water (172 BWPD, 46 BOPD). This is the "B1 & 2" Zone Workover potential, to drop from report.

### Recap of Workover:

1. Final Perforations: "B-1" Zone 5651-5659' (unchanged); "B-2" Zone 5668-5680' (unchanged) and "C" Zones 5817-5837' (blanked off)
2. Final PBTD: 5837' T.D. (unchanged)
3. Workover Potential: Pumping 218 BFPD, 79% water (172 BWPD, 46 BOPD)
4. Geologic Name of Producing Zones: "B1, 2 & C" Zones of Madison Formation

Results of Workover: Oil production increased from 44 BPD to 46 BPD and water cut decreased from 205 BPD to 172 BPD. Workover Successful.

Tubing Record: 129 jts. of 2-7/8", 6.50#, J-55, 8rd. thd., R-2, Class 2 and  
55 jts. of 2-3/8", 4.70#, J-55, 8rd. thd., R-2, Class 2  
American tubing

Below RKB	11.70'
129 jts. 2-7/8" tubing	3967.29'
Seating nipple	1.20'
55 jts. 2-3/8" tubing	1692.11'
Bottom of tubing	5672.30' = 5666.5' Wireline

Rod Record:

39 -- 7/8" Scraper Rods  
23 -- 7/8" Plain Rods  
96 -- 3/4" Plain Rods  
2 -- 7/8" Subs (6' & 2')

Pump Data: 2-1/2" x 2" x 12' Oil Well with 3 cup top hold down.

71m.F  
WORKOVER HISTORY NO. 3

March 18, 1963

Lease and Well Number: East Poplar Unit Well No. 9

Field: East Poplar County Roosevelt State Montana

Well Location: C SW SW Section 11, T28N, R51E

Status Prior to Present Job:

Date Completed: September 25, 1952 Date of Last Workover January 29, 1959

T.D.: 5837' FBTD: None Producing Zones: "B1, 2, & C" Zones of

Madison Formation Perforations: "B-1 Zone 5651'-5659'; "B-2" Zone 5668'-5680'

and "C" Zone 5817'-5837' Cumulative Production: through February, 1963 was

"B1 & 2" Zones -- 184,263 BO and 277,697 BW; "C" Zone -- 134,981 BO and

209,756 BW Latest Test: Tested on March 5, 1963 from the B-1, B-2, & C Zones

586 BWPD, 6 BOPD

Justification for Workover: to repair indicated casing leak from well test on March 5, 1963.

Summary of Workover:

3-7-63 TD 5837' - Rigged up pulling machine to locate and repair casing leak. Pulled rods and tbg. Ran tbg. w/Baker Model "R" Packer. Found obstruction in casing at 3823'. Test 5½" casing above packer. Held ok. Attempted to work and circ. packer through tight places with no success. Circ. out mud was def. indication of leak in casing.

3-8-63 TD 5837' - Pulled packer out of hole. Ran tbg. with Baker casing scraper and 4 3/4" bit. Attempted to rotate and circ. through bad place with no success. Circ. up iron cuttings indicating 5½" casing collapsed at 3823'. Pulled bit and scraper out of hole, shut down for tools.

3-9-63 TD 5837' - Ran 4 3/4" impression, 3 stands tbg. on sand line. Picture indicated split jt. in casing. Ran 4 5/8" swedge, 6-3½" drill collars, oil jars, bumper jars and safety jt. Swedged through tight places at 3823'. Made trip and run 4 3/4" swedge through bad place. Note: Collapsed spot in casing about 1 ft. long. Pulled swedge to 3810' and Dia-Logged Tbg.

Summary of Workover continued

- 2-10-63 TD 5837' - Pulled tbg. and laid down 55 jts. bad tbg. Ran Model "R" Packer, set at 3810'. Test casing with 1200 lbs. Held ok. Set Model "2" at 3851'. Test casing with 1200 lbs. Would not hold and also communicated around. Indicated possible two leaks. Set Packer at 3851', press. casing to 1200 lbs. Would not hold, no communication. Pulled Model "R" Packer due to limited pump capacity on hot oil truck. Ran Baker full bore packer and retrievable bridge plug.
- 3-11-63 TD 5837' - Set bridge plug at 4022 ft. and test with 2300 lbs. Held. Spot 2 bbls. gel on bridge plug. Located casing leaks at 3823' and 3874'. Set packer full bore at 3812' and test casing and BOP with 1500 lbs. Held. Broke formation with 1400 lbs. at 4 1/2 BPM. Squeeze casing leaks (3823' and 3874') with 50 sacks reg. cement and HR-4 retarder. Max. squeeze press. 1200 lbs. Cleared tool with 5 bbls. water. Let cement set 6 hours. Set packer at 3930' and test bridge plug. Held ok. Squeeze No. 2 with 50 sacks reg. cement and HR-4 retarder added. Max. pressure 1500 lbs. Cleared tool with 5 bbls. water. Let cement set overnite.
- 3-12-63 TD 5837' - Ran Baker full bore packer at 3930' and test bridge plug with 2000 lbs. Held. Re-set packer at 3697'. Test BOP and casing with 1500 lbs. Held. Squeeze No. 3 with 75 sacks Haled 9 cement. Broke formation with 3 bbls. water with 1500 lbs. Spot cement down tbg. Pumped cement clear of tbg. Staged cement 7 hours. Max. squeeze press. 1700 lbs. Would not hold. Left 22 ft. of cement or 1/2 sack in casing above leak at 3823'. Reversed out tbg. Then reset packer and shut well in with 500 lbs. on tbg.
- 3-13-63 TD 5837' - Pumped into leak at 2000 lbs. PSI. Found cement bridge at 3823'. Unable to test bridge plug. Reset tool at 3697' and test casing and BOP with 1500 lbs. Held. Squeeze No. 4 with 75 sacks Haled 9 cement. Spot cement down tbg. Pump cement clear of tbg., then staged 4 1/2 hours. Max. squeeze press. 3500 lbs. Held ok. 66 sacks cement out in formation, left 9 sacks in casing. Pulled tbg. out of hole. One slip was missing from Baker full bore packer. Shut in overnite.
- 3-14-63 TD 5837' - Ran magnet on sand line. Recovered small spring and piece of ring which holds slip on packer. Rerun with no success. Ran tbg. with magnet and skirt. Tagged cement at 3743'. Rotated and circ. tbg. Did not recover slip. Made two runs with magnet on sand with no success. Ran tbg. with 4 3/4" bit. Drilled 157 ft. of hard cement. No indication of slip. Tagged bridge plug with tbg. Test casing with 1500 lbs. Held ok. Shut in overnite.
- 3-15-63 TD 5837' - Made trip with tbg. to pick up retrieving head. Reversed out gel, then fished bridge plug. Ran tbg. with seating nipple and Baker latch on and seal assy. Ran rods with 2 1/2" x 2" x 16' Oilwell pump. Started pumping.

Summary of Workover continued

- 3-16-63 TD 5837' - Pumping. Water cut 87 percent and 7 percent mud. Chlorides 40,000 PPM. No test.
- 3-17-63 TD 5837' - Pumping. On 4 hour test, pumped at rate of 304 BFPD. 93 percent water and mud. 5 percent mud. 21 BOPD, 283 BWPD. Chlorides 55,000 PPM.
- 3-18-63 TD 5837' - Pumping. On 24 hour test, pumped 302 BFPD. 65 percent water with trace of mud. 45 BOPD, 256 BWPD. Chlorides 55,000 PPM. Test of B and C Zone pumping Co-mingled. To drop from report.

Recap of Workover:

1. Final Perforations: "B-1" Zone 5651-5659' (unchanged), "B-2" Zone 5668-5680' (unchanged) and "C" Zone 5817-5837'.
2. Final PSTD: 5837' T.D. (unchanged)
3. Workover: Test of B & C Zone co-mingled. Pumping 302 BFPD, 35% water (256 BWPD, 45 BOPD)
4. Geologic Name of Producing Zones: "B1, 2 & C" Zones of Madison Formation

Results of Workover: Tested at rate of:  
"B1&2" Zone 87 BFPD, 65 BWPD, 21 BOPD, 76 % water  
"C" Zone 217 BFPD, 196 BWPD, 21 BOPD, 90 % water  
Workover Successful

Tubing Record: 186 jts. of 2-7/8", 6.50#, J-55, 8rd. thd., R-2, Class 2  
American tubing.

Below RKB	10.00'
186 jts. 2-7/8" tubing	5781.87'
2 Seating nipples, 1-2 3/8 & 1-2 7/8	2.55'
2 Swedges 2-7/8 x 2-3/8	1.67
1 Perforated nipple 2-3/8"	6.14
Top of packer	5802.23 = 5803' Wireline
Baker Seal Assemblies	3.10'
Stinger	4.40'
Bottom of tubing	5809.73'

Rod Record:

33	-- 7/8"	Scraper Rods
57	-- 7/8"	Plain Rods
136	-- 3/4"	Plain Rods
2	-- 7/8"	Subs (4')

Pump Data: 2-1/2" x 2" x 16' Oil Well with 3 cup top hold down.

# YAPUNCICH-SANDERSON LABORATORIES

5 NORTH 25TH ST.  
BILLINGS, MONTANA

Lab. No. 1299

## WATER ANALYSIS REPORT

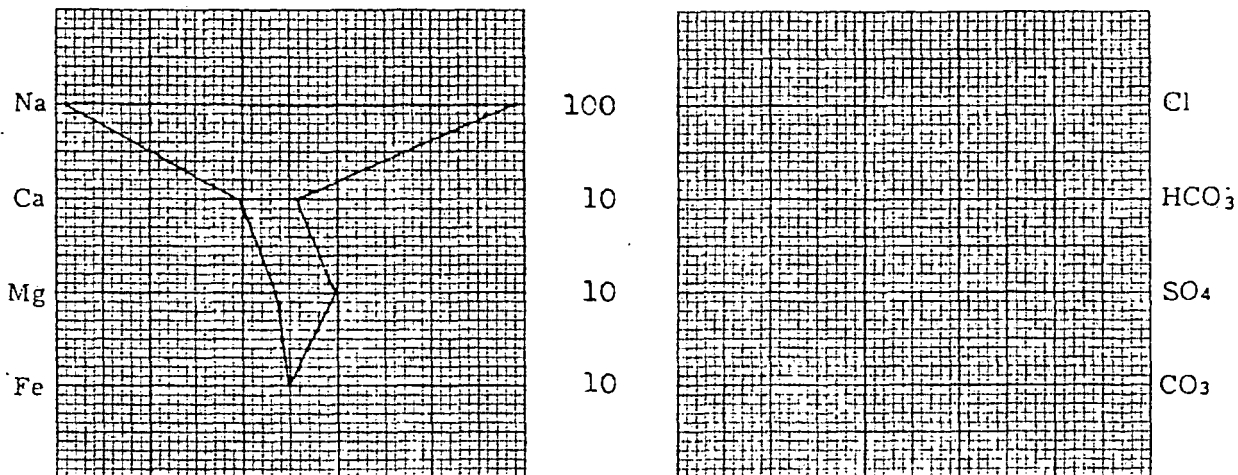
Field East Poplar County Roosevelt State Montana  
Well No. 9 Location C SW SW 11-28N-51E  
Formation C-Zone Depths \_\_\_\_\_  
Operator C. H. Murphy Corporation Date Sampled 3-10-53  
DST No. \_\_\_\_\_ Sample No. \_\_\_\_\_ Date Analyzed 4-23-53  
Other Data Clear colorless water with oil on top of sample. H<sub>2</sub>S present.

Constituents	PPM	MEQ.	MEQ. %	Total Solids in Parts per Million
Sodium	55,309	2405.80	48.59	By evaporation <u>145,100</u>
Calcium	1072	53.49	1.08	After ignition <u>143,300</u>
Magnesium	199	16.36	0.33	Calculated <u>144,951</u>
Sulfate	2342	48.71	0.98	
Chloride	85,850	2420.97	48.90	pH <u>5.5</u>
Carbonate	0	0	0	Specific gravity @ 60°F <u>1.096</u>
Bicarbonate	364	5.97	0.12	Resistivity @ 68°F ohms/meter <sup>3</sup> <u>0.068</u>
Hydroxide	0	0	0	

NOTE: Sodium and potassium reported as sodium. MEQ.=milliequivalents per liter  
PPM=parts per million (milligrams per liter). 1 PPM equivalent to 0.0001%

## WATER ANALYSIS PATTERN

Scale  
MEQ. Per Unit



Correlation:

SPECIALIZING IN CORE, WATER, GAS AND CRUDE OIL ANALYSES

# YAPUNCICH-SANDERSON LABORATORIES

BILLINGS, MONTANA

P. O. BOX 593

5 & 9th N-25th St.

Lab. No. EXTRA (42)

## WATER ANALYSIS REPORT

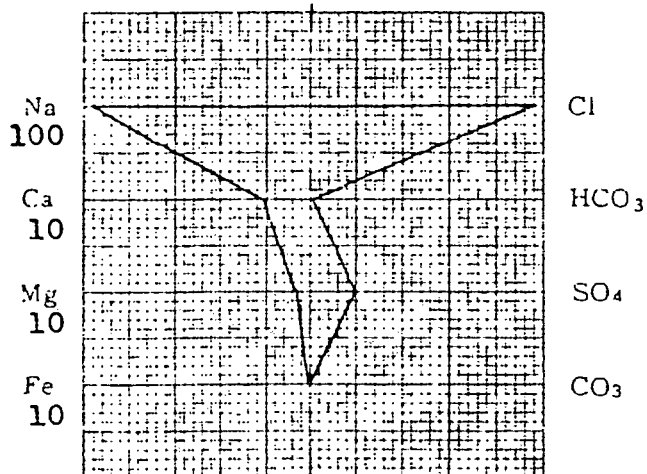
Field East Poplar County Roosevelt State Montana  
 Well No. 9 Location C SW SW 11-28N-51E  
 Formation "C" Zone - Charles Depths \_\_\_\_\_  
 Operator C. H. Murphy Corporation Date Sampled 3-10-53  
 DST No. \_\_\_\_\_ Sample No. \_\_\_\_\_ Date Analyzed 4-23-53  
 Other Data Clear colorless water with oil on top of sample. H<sub>2</sub>S present.

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Carbonate	0	0	0	Specific gravity @ 60°F <u>1.096</u>
Bicarbonate	364	5.97	0.12	Resistivity @ 68°F ohms/meter <u>0.068</u>

Chloride as NaCl 141,567 PPM. Total Solids From Resistivity as NaCl 143,844 PPM.

NOTE: Sodium and potassium reported as sodium. MEQ milli-equivalents per liter. PPM = parts per million (milligrams per liter). 1 PPM equivalent to 0.0001%.

**Water Analysis Pattern**  
Scale MEQ. Per Unit



100

100

100





